# The Beginning of a New Era in the Census Method of Turkey, Use of Registers: Lessons Learned and Future Prospects

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**Abstract:**

In Turkey, **the first population census** was carried out in **1927**. The following population censuses were carried out between 1935 and 1990 regularly, in years ending with 0 and 5. After 1990, population censuses were decided to be carried out in years ending with 0 by a law and in this regard, **the last census** was carried out **on 22nd October 2000**. Until the last census in 2000, **14 population censuses** were conducted in Turkey.  In 2007, Address Based Population Registration System (ABPRS) was established and basic population figures were compiled from then on from this system. According to the 2007-2011 Official Statistics Program of TurkStat, 2011 Population and Housing Census of Turkey was conducted with respect to the international recommendations and in line with EU Requirements. Turkey applied combined method in 2011 census (by using population registers and by conducting register based large-scaled sampling survey). The aim of this paper is to summarize how 2011 Population and Housing Census was conducted in Turkey with special emphasis on lessons learned from this experience.

## 1.  Background

In Turkey censuses were conducted to determine the population by administrative units (province, district, town, village) as well as to have information on the demographic, social and economic characteristics of the population and on dwellings.

In the absence of reliable data from the registration system, population censuses were main data sources on population size and the characteristics of population. But **obtaining usually resident population (de jure)**, which is a core variable recommended by the UNECE/Eurostat, **was not possible** from population censuses because of de facto population definition. On the other hand, **there was limited information** for plans and programs of administrative work, because information on the size and characteristics of population was obtained from population censuses conducted in every five/ten years. And also their **data processing took around 3,5 years**. So, there was no updated information related to the population.

In Turkey, financial support for municipalities is determined according to population size of the municipalities by the law. In addition, there is a threshold population to establish a municipality. Especially for small administrative units, moving population from one locality to another on the census day and **adding imaginary population** to their enumerated population were very important problems for the country.

In Turkey, **the first population census** was carried out in **1927**. The following population censuses were carried out between 1935 and 1990 regularly, in years ending with 0 and 5. After 1990, population censuses were decided to be carried out in years ending with 0 by a law and in this regard, **the last census** was carried out **on 22nd October 2000**. Until the last census in 2000, **14 population censuses** were conducted in Turkey.

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In Turkey two main periods could be mentioned for determining population figures. The first period regards to 1927-2000. Between these years, as mentioned above, traditional census method was applied. The second period regard to the time after the implementation of the Address Based Registration started in 2007.

**Address Based Population Registration System (ABPRS)** was established in order to obtain updated information on population of localities and to follow the population movements. The aim of this study is to develop existing administrative records based on addresses. Population Registration Law No. 5490 dated April 25, 2006 charged Turkish Statistical Institute (TurkStat) for establishing the system and the Ministry of Interior, General Directorate of Population and Citizenship Affairs (GDPCA) for developing and maintaining the system. According to the Law, the National Address Database (NAD), which covers all address information in Turkey, was established firstly. And then the ABPRS was established by obtaining usual residence addresses of Turkish Citizens and foreigners living in the country and matching these information with the population registers. Furthermore, all governmental organizations and establishments use the system in all their administrative works.

After **the establishment of the ABPRS in 2007**, **annual information** on population size by administrative division (province, district, town, village and quarter), and its basic characteristics (age-sex structure, place of ledger registration, nationality, literacy and educational attainment, legal marital status, and internal migration in province level) is **announced to the public in January of the following year based on the registers**. Databases are produced for ABPRS and users can create dynamic tabulations (www.turkstat.gov.tr).

## 2. 2011 Population and Housing Census in Turkey

According to **the 2007-2011 Official Statistics Program of TurkStat, 2011 Population and Housing Census of Turkey** was conducted with respect to the international recommendations and in line with EU Requirements. Turkey applied **combined method** in 2011 census (by using population registers and by conducting register based large-scaled sampling survey).

### 2.1. Preparation

Preparation study of Population and Housing Survey (PHS) had been started at the second half of 2008. An intense and long-term study was needed for planning and performing the all processes up to dissemination of the results. An advisory board, which was formed by decision makers of the related institutions, was constituted to execute the preparation and implementation activities of Population and Housing Survey more effectively, with collaboration of the other institutions.

Six working groups (methodology, organization of the field study and implementation, software, budgetary, publicity and publication) were formed for planning the preparation and implementation activities of the census, making methodological studies, making reports etc.

Variables in the questionnaire were set out with consideration of country needs and the advices of UNECE/Eurostat and United Nations for the countries which would execute population and housing censuses in the years around 2010 (UNECE, 2006).

A total of 4 pretest and pilot studies were conducted before the finalization of the questionnaire, data entry programme and field application phases. In these studies comprehensibility of the questions and the design of the questionnaire was tested besides the average time for filling up a questionnaire. **Two kinds of questionnaires** (household and institutional places questionnaires) were used in the field study.

The household questionnaire includes questions regarding buildings and dwellings; migration; disability; education; marital status (could be different from the official status); labor force participation; fertility and mortality. The institutional places questionnaire includes the same questions regarding individuals.

## 2.2. Sampling and Coverage

Enumeration areas consisting of approximately 100 dwellings (the addresses in which there are registered persons in ABPRS) were defined. 22 861 sample enumeration areas (% 11.7) were selected from 195 192 enumeration areas. University student dormitories, nursing homes, prisons, and military barracks were not included in the address lists and in the count of 100 addresses because a separate application for institutional places was held.

The citizens of Republic of Turkey and foreign national people who are residing within the borders of the Turkey are covered. Foreign national people who are living/going to live in our country for a time shorter than six months and the citizens of Republic of Turkey who are living provisionally in Turkey at the survey period are out of coverage.

## 2.3. Publicity

A series of publicity activities were implemented regarding the 2011 Population and Housing Census in order to inform public about the importance of the census, create consciousness on the importance of the statistical information, and provide support by effective informing. Working group on publicity was established in 2009 and gave the acceleration to the works in 2010. Official campaign was started with the Press-Statement of the State Minister in 2010.

A logo was designed to be used in all census instruments. A competition for the census poster was organized. According to the result of the competition, one poster was chosen for the publicity campaign of the census in April 2011. The copies of poster were spread through the Regional Offices of TurkStat in July 2011.

In addition, bookends were designed. A leaflet was also designed in order to be delivered to the households which the questionnaires were applied to. Before the field application, household letters were posted to the households for informing the households.

Promotional activities were carried on to indicate the importance of survey to public opinion, to create awareness about the necessity of statistical information, for effective evaluation and raising the participation to survey.

## 2.4. Organization of the Field Study

Regional Offices of TurkStat performed organization of the field study, by the coordination of Central Office of TurkStat. Approximately 3 600 enumerators, 400 controllers and responsibles of provinces and districts took part in the field application.

Field study of the survey had two stages; i) address control study, and ii) Population and Housing Survey field study. The first stage of the study consisted of two processes; i) Institutional Places Address Control and ii) Enumeration Areas Address Control (enumeration areas in the sample).

In 2011 Population and Housing Census, interviewers visited all addresses in their sample enumeration areas and filled in questionnaires for every address (dwelling, office, etc.) that people reside, by face to face method.

In the field application, netbooks and questionnaires were used. 60 % of the application was carried out by using netbooks and 40% of the application was carried out by paper questionnaires.

Registered persons in ABPRS were checked regarding actual situation in the addresses in the sample enumeration areas. By this study, actual situation of registered persons (according to ABPRS) in the addresses in the sample enumeration areas were tried to be explored. Those who were registered in the addresses, but no longer residing in the addresses due to moving, military obligation, education, death and so on were determined.

In the field application, ABPRS list was used. In the netbook application, ABPRS lists of related addresses were installed on netbooks. If the persons listed in the registers could not be reached in the field, information on these persons was taken from apartment manager, concierge, muhtar, etc.

The survey application took about two to three months depending on the regional office. The survey started on 3rd October 2011 and ended on 31st December 2011 except for one regional office (Van). The delay in Van region was due to the earthquake that occurred in November 2011.

At the end of the survey, in 4119 localities (948 province and district centers and 3171 sub-districts and villages), approximately 2,2 million households were interviewed. In these households about 8 million individuals were interviewed.

### 2.5. Data Entry and Analysis

The data entry program was developed by TurkStat staff. A java-based programme was developed for data collection for netbooks. Data transfer from netbooks to the main system was provided every 2-3 days through this programme via internet.

Data entry of paper based household questionnaires was also realized through this programme and data was transferred to the main system. Only data that was entered for the first time or data updated could be transferred. If a new version of program was available data couldn't be transferred before the program was updated.

The advantages of netbook usage are numerous. First of all, netbook usage provided some cross checks between answers at the time of interview. Checks in the program increased the data quality. Besides, netbook usage for data capture created time efficiency compared to other methods (ICR, manual data entry). And the most importantly, by the online data transfer which allowed enumerators to send the data to the main system, field application could be monitored daily through central web based system.

Data entry of institutional places questionnaires were realized through a separately designed web based programme.

Daily and weekly reports were taken from central system to monitor the field application. The main reports were reports regarding completeness of enumeration areas. Besides, there were daily reports for monitoring main issues such as non-response rates. Also, there were further analysis reports which aimed to better monitor the responses by enumeration area. Interviewers, controllers and province leaders could monitor daily reports. Each could see only ad-hoc reports within their responsibility area. Province leaders could see reports for province total, counties, controllers and enumeration areas. Controllers could see reports for total and each of enumeration areas. Interviewers could see reports on the netbook.

Province leaders could see reports for province total, counties, controllers and enumeration areas. Controllers could see reports for total and each of enumeration areas. Interviewers could see reports on the netbook.

Simultaneous web based consistency check reports were visualized to the Regional Offices during the field application for improvement. These reports were prepared by using a data analysis programme. A procedure was prepared and this procedure was run every night. There were two main types of reports. One type was certain errors which were expected to be corrected essentially. Most of these were produced to check any type of software errors. The other types of errors were to be checked and corrected whenever necessary.

**2.6. Quality Check Study**

Quality Check Study of 2011 Population and Housing Census was conducted by a different department than the department in charge of the census between 15 November and 15 December 2011. This ensured the objectiveness and improved the quality of the study. The study was carried out in approximately 5% of the sample enumeration areas.

**3.   Lessons Learned**

2011 witnessed the opening of a new era for Turkey regarding the census method. For the first time registers were used in the census accompanied by a large sampling survey. Besides, netbooks were used for such a huge field operation for the first time. As a result, this combined method turned out to be a success story for Turkey. Inevitably, every innovation has its flaws at the first shot. These flaws should be analyzed well in order to come up with solutions and improvements for the studies in the future. Thus, the lessons learnt from 2011 experience were well documented and put forth. In this section lessons learnt from 2011 Population and Housing Census will be demonstrated. Even some minor points are displayed to contribute to more efficient operations and more successful results.

The advantages of the new method are numerous. First of all, the number of field staff needed for collecting data was much less than 2000 Population and Housing Census. This created advantage in terms of budget, quality of staff and controlling the field operation and logistics.

There were also some deficiencies in the application which should be mentioned to be taken into consideration before the next census. The duration of data entry program testing should be longer and further program testing procedures should be applied. A longer term should be implemented for choosing and  training of the field staff. Geographical Information Systems (GIS) should be used for creating enumeration areas on orthophotos. Duration of the field application period should be shorter. Administrative registers should be used during the field application to check the quality of the data (simultaneously from the beginning to the end of the field application).

In the next census analyzing stages should be tested in advance, quality control study should be done according to a scheduled program, integrating the current surveys with registers should be warranted and new techniques should be explored.

The application of the survey with netbooks resulted that the survey was conceived by a greater importance by the households. The use of netbooks also provided the survey to be conducted in a shorter time and the built-in edits provided more quality data. Netbook usage for data captures also created time efficiency compared to other methods (ICR, manual data entry). By the online data transfer which allowed interviewers to transfer data to the main system, field application could be

monitored daily through central web based system. On the other hand there were flaws regarding the use of netbooks.

The response given to the first question of the migration section affects the succeeding 11 questions. One of the responses makes the software automatically skip the other 11 questions. Such situations were also available in the labor force, fertility and mortality sections of the questionnaire and these situations have turned out to be abused by some of the interviewers. These interviewers were determined and were warned after the detection of the situation in the second week of the census operation. This situation caused to extend length of data collection and analysis process. In the future, these kinds of situations should be better analyzed before the beginning of the operation and precautions should be taken.

While the field application was continuing, data analysis studies were executed simultaneously. As a result of detailed analysis, many analysis tables were produced in different times and same households were visited several times. This work was led to an increase in respondent burden.

Consistency checks must be determined before the field application. Interviewers should be warned with pop-ups at the time he/she make a mistake that would lead an internal inconsistency. Thus, errors would be corrected immediately without a need for later on analysis.

## 4. Conclusion

The plans for the next census are to conduct the next census fully register based in Turkey. 2011 application showed that there is no use of asking questions on a subject when administrative registers are available.

Also, in such a huge field application number of questions should be limited to increase data quality. Analysis procedures should be well planned and tested before the main application. Personnel should be trained for more and further attention should be given to training processes. One other issue to be addressed is that the duration of the field application should be kept shorter.

The changing the system from traditional census to administrative registers has many advantages to produce more up-to-date and reliable statistics. From the statistical point of view, sample frame for the household surveys are determined by National Address Database which is updated daily. Basic statistics on population is compiled on an annual basis without any expenditure. In addition, the method of next census of Population and Housing Census will be developed based on registers (ABPRS and others) and it will reduce the cost compared to the traditional census.

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